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reflector of the Lick Observatory. Spectrum on the stained plate was compared with spectra on ordinary plates. The spectrum of central star is continuous and like spectra of central star of planetary nebulae. The spectrum of central star is relatively stronger in ultra-violet light than the bluest of the Orion type of stars. The distribution of elements in the nebulous ring are probably not identical.

14. The conclusions reached in the paper by Percival Lowell are: That parallaxes beyond 0".067 are too small to be trustworthy, and that the masses of those stars for which alone we have dependable data are, in the mean, almost exactly the same as that of the sun.

The following members of Section A were elected as fellows: M. J. Babb, E. W. Bass, H. Y. Benedict, G. D. Birkhoff, A. B. Chace, Arnold Dresden, Eric Doolittle, J. C. Duncan, T. C. Esty, Max Fischer, G. W. Hartwell, H. G. Keppel, A. S. Hawkesworth, T. H. Hildebrandt, N. J. Lennes, W. H. Maltbie, Max Mason, Helen A. Merrill, E. J. Miles, A. B. Pierce, A. R. Schweitzer, F. H. Seares, Mary E. Sinclair, Clara E. Smith, E. R. Smith, A. W. Stamper, A. L. Underhill, C. E. Van Ostrand, F. W. Very, W. D. A. Westfall, E. J. Wilczynski, F. B. Williams, T. W. D. Worthen, E. I. Yowell. The section elected President E. O. Lovett member of the council, President C. S. Howe member of the sectional committee, and Dean H. T. Eddy member of the general committee. On recommendation of the sectional committee Professor E. B. Frost, director of the Yerkes Observatory, was elected chairman of the section.

G. A. MILLER,

Secretary of Section A

UNIVERSITY OF ILLINOIS

SOCIETIES AND ACADEMIES

THE BOTANICAL SOCIETY OF WASHINGTON

THE 68th regular meeting of the society was held at the Cosmos Club, Friday, December 16, 1910, at eight o'clock P.M. President W. J. Spillman presided. Thirty members were in attendance. H. A. Edson, E. P. Humbert, F. J. Pritchard and W. H. Long were admitted to membership.

The following papers were read:

Propagation of Sea Island Cotton: Dr. W. H. EVANS.

An account was given of the work of the Hawaii Agricultural Experiment Station with

cotton, especial attention being called to the vegetative propagation of the cotton plant. At the Hawaii Station experiments with Sea Island and Caravonica cottons have been in progress for several years, and it has been found advantageous to grow them as perennial crops, pruning the plants every year, the Sea Island to about six or eight inches of the previous year's growth and the Caravonica about one half the growth of the season preceding. After pruning, the plants start growth rapidly and within five months are producing squares. By paying attention to the time of pruning, harvesting can be regulated to come at a time when picking can be most economically done. In the experiments described above, the prunings have been taken as cuttings, rooted, and then set into the field. In this way a number of superior strains have been propagated without the possibility of crossing. As the older plants yield fifty to one hundred cuttings at a pruning and practically all root quickly, this is not as slow a method of propagating as would be at first thought.

In addition to increasing cotton by cuttings, it has been found possible to propagate it by budding and grafting, and a considerable number of plants have been successfully top-worked with especially fine strains of cotton.

Pecan Scab: M. B. WAITE.

The pecan, being a native forest tree, is not as subject to destructive outbreaks of fungous diseases as other cultivated nuts and fruits. It is native of the Mississippi Valley as far north as Iowa and central Illinois, and extends eastward into Alabama and westward into Texas. It is mainly planted in commercial orchards throughout the cotton belt, but particularly in the district where sugar cane can be cultivated. It is not expected, therefore, that the pecan should have such destructive diseases as the bacterial blight of the English walnut, pear-blight of the pear and apple, yellows of the peach tree, or the black-rot, downy mildew or phylloxera of the European grape when the latter is grown in the eastern United States.

There is an apparent exception to this in the pecan scab, caused by the fungus *Fusicladium effusum* Winter. This exception comes about through the transfer of seedlings and horticultural varieties, such as San Saba and Sovereign which originated on the western limit of the pecan in Texas, where the summers are dry, to the humid conditions of the gulf coast states and the Carolinas. The Texas group of varieties are

often severely attacked by the scab fungus, particularly on the nuts, and the crop partially or totally destroyed. The *Fusicladium* attacks the young leaves as they unfold in the spring. The young leaflets and the leaves are successively attacked through the growing season while they are developing. Each leaf and leaflet as it reaches maturity becomes immune, or nearly so, to the fungus infections. The fungus also attacks the young growing twigs, but particularly the nuts. The nuts continue to develop through the summer and remain susceptible until late in September.

Infections take place at definite periods, namely, the warm, rainy, humid spells that occur so frequently in the southeastern states. An interesting feature was found in relation to the life history of the disease, namely, that a plant louse which becomes common on the pecan in May punctures the epidermis in a regular way along the veins and veinlets. The punctures of this plant louse are used as points of entrance by the *Fusicladium*. The fungus can also enter in the direct way and such diseased spots are irregularly located over the leaves, fruit and twigs, but the spots due to aphid infections are arranged in regular lines along the veinlets and far exceed in number all other spots on the leaves. The fungus evidently is also assisted in its germination and growth by the honey dew copiously secreted by these aphids.

Spraying experiments showed that bordeaux mixture controlled the scab thoroughly and is probably the best fungicide for treating it. Diluted lime-sulphur solution also controlled the scab nearly as well and killed the aphids, thus making it a promising mixture to use, at least in part of the treatments. The unfortunate fact that the nuts remain susceptible throughout the summer makes treatment difficult and expensive, so that four or five, and even six sprayings may be necessary for success.

Extensive observations through the south by a number of pecan students, as well as the experience of practical pecan growers and nurserymen, have shown that a large number of varieties are reasonably resistant to this disease. These varieties have nearly all originated from Louisiana stock, or at least from trees grown in the humid regions adjacent to the Mississippi and the gulf. Since many of the finest paper-shell varieties are commercially resistant to the scab fungus, they should, of course, be selected for cultivation in the humid southeastern states. Furthermore, instead of recommending the treatment by spraying

of the badly scabbing varieties, it is suggested that these varieties, as well as susceptible seedlings, be top-worked to resistant sorts.

Bubonis' Flora Pyrenæa: Dr. E. L. GREENE.

W. W. STOCKBERGER,
Corresponding Secretary

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 40th annual meeting (686th regular meeting) was held on December 17, 1910. President Woodward in the chair.

After hearing the reports of the secretaries, the treasurer and the auditing committee, the annual election for the selection of officers for the calendar year 1911 was taken up, and the following officers were duly elected:

President—A. L. Day.

Vice-presidents—L. A. Fischer, C. G. Abbot, E. B. Rosa and G. K. Burgess.

Treasurer—L. J. Briggs.

Secretaries—R. L. Faris and W. J. Humphreys.

General Committee—E. Buckingham, W. S. Eichelberger, E. G. Fischer, B. R. Green, R. A. Harris, P. G. Nutting, F. A. Wolff, W. A. DeCaindry and J. A. Fleming.

After the election of officers a buffet luncheon was served.

R. L. FARIS,
Secretary

THE AMERICAN CHEMICAL SOCIETY NORTHEASTERN SECTION

THE one hundredth meeting of the section was celebrated by a dinner held at the Exchange Club, Boston, on December 16. President Wilder presided, and there were one hundred members and guests present.

The evening was devoted to a consideration of "The Conservation of our Natural Resources." Hon. Curtis Guild, Jr., ex-governor of Massachusetts, spoke on the conservation of forests for the sake of both timber and water, and he urged the duty of the federal government to provide national reservations in the east as well as in the west.

Mr. H. M. Wilson, of Pittsburgh, assistant chief of the Bureau of Mines of the Department of Commerce and Labor, described the work of this bureau and dwelt particularly on the progress in the prevention of coal mine disasters and in the care of injured miners.

KENNETH L. MARK,
Secretary